

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

EXPRESS MAIL NO. EL368756961

Applicant : Wai King, et al.
Application No. : To Be Assigned
Filed : May 25, 2001
Title : RECEIVE PROCESSING FOR DEDICATED
BANDWIDTH DATA COMMUNICATION
SWITCH BACKPLANE
Docket No. : 45245/JEJ/X2

PRELIMINARY AMENDMENT

Assistant Commissioner for Patents
Washington, D.C. 20231

Post Office Box 7068
Pasadena, CA 91109-7068
June 1, 2001

Commissioner:

Prior to examination, please enter the following amendment:

In the Specification:

Before the section entitled "BACKGROUND OF THE INVENTION," please insert the following:

-- CROSS-REFERENCE TO RELATED APPLICATION

This application is a continuation of pending U.S. Patent Application No. 09/063,493, filed on April 20, 1998, the disclosure of which is incorporated fully herein by reference. --

In the Claims:

Please cancel claims 3, 4, 6 and 9-14 without prejudice from this continuation.

Please amend claim 1 as follows:

1. (Amended) In a data switching system having a plurality of switching controllers for exchanging data units over a backplane, at least one controller having an interface for transmitting data on the backplane and an interface having a plurality of ports for receiving data off the backplane in parallel from all transmitting interfaces, wherein at least one port

is assigned a different clock cycle within a repetitive timing cycle for initiating the release of a data unit to a queue, and wherein at least one data unit must pass a filtering check and a watermark check to receive queueing clearance, a method for conducting receive processing, comprising:

sequencing the data units in said at least one controller for conducting the filtering check, the data units having been received via the interface having the plurality of ports off the backplane in parallel from all transmitting interfaces;

conducting the filtering check on the data units in accordance with the sequence;

conducting the watermark check on the data units;

filtering the data units which fail the filtering check;

delaying the data units which pass the filtering check and fail the watermark check, until the watermark check is passed; and

queueing the data units which pass the filtering check and the watermark check.

2. The receive processing method according to claim 1, wherein the step of sequencing the data units comprises:

- (a) determining the ports on which the data units were received;
- (b) determining the current clock cycle within a repetitive timing cycle;
- (c) from the determinations in (a) and (b), assigning a priority to at least one data unit as a function of the number of clock cycles the data unit's port would have to wait before initiating the release of the data unit in the event queueing clearance for the data unit were received; and
- (d) sequencing the data units in accordance with their assigned priorities.

5. In a data queueing system including a plurality of ports, at least one port having a data unit for release to a queue and at least one port assigned a different clock cycle within a repetitive timing cycle for initiating the release of the data unit to the queue, and wherein at least one data unit must pass a filtering check as a condition for receiving queueing clearance, a method for sequencing data units received on the ports for the filtering check, comprising:

- (a) determining the port on which the data units were received;

- (b) determining the current clock cycle within a repetitive timing cycle;
- (c) from the determinations in (a) and (b), assigning a priority to at least one data unit as a function of the number of clock cycles the data unit's port would have to wait before initiating the release of the data unit in the event queueing clearance for the data unit were received; and
- (d) sequencing the data units in accordance with their assigned priorities.

7. The sequencing method according to claim 5, wherein the determination in (c) is made by consulting a pre-configured "look-up" table.

8. The sequencing method according to claim 5, wherein the filtering check is performed in a CAM integrated circuit.

REMARKS

Claims 1, 2, 5, 7 and 8 remain in the application. Claims 3, 4, 6 and 9-14 have already been allowed in the pending U.S. Patent Application No. 09/063,493, and thus have been canceled without prejudice in this continuation. Claim 1 has been amended.

Claims 1, 2, 5, 7 and 8 have been rejected in the Office Action mailed February 27, 2001 for the pending U.S. Patent Application No. 09/063,493 under 35 U.S.C. 103(a) as allegedly being unpatentable over Egbert, et al. (U.S. Patent No. 6,115,387) in view of Simmons et al. (U.S. Patent No. 6,084,856) and Willmann, et al. (U.S. Patent No. 5,521,923).

Claim 1 has been amended to include a relevant portion of the preamble into the body of the claim to give patentable weight to the limitation of "the data units having been received via the interface having the plurality of ports off the backplane in parallel from all transmitting interfaces." in response to the Examiner's indication in the Office Action that a preamble is generally not accorded any patentable weight. Applicants respectfully submit that Claim 1 as amended does not include new matter and does place claim 1 in condition for allowance.

In claim 1, the steps of "sequencing . . . ; conducting the filtering check on the data units in accordance with the sequence; conducting the watermark check on the data units; filtering the data units which fail the filtering check; delaying the data units which pass the filtering

check and fail the watermark check, until the watermark check is passed; and queueing the data units which pass the filtering check and the watermark check” are performed on the data units that have been “received via the interface having the plurality of ports off the backplane in parallel from all transmitting interfaces.” This is indicative of an egress-side processing where the controller performs the aforementioned steps after receiving the data units (e.g., from another controller) off the backplane.

According to the Examiner in the Office Action mailed February 27, 2001 for the pending U.S. Patent Application No. 09/063,493, “Egbert discloses a method of sequencing the data unit received on the ports for filtering check which comprises a step of determining the received port (Col 2, lines 11-12) and forwarding to output queue after passing the filter check using forwarding database “look-up table, CAM” (Col 5, lines 37-65).” (Office Action, page, 2, paragraph 3). The “ports” in Egbert appear to mean “MAC ports” as shown in the following recitation, “[t]he switch 12 includes twenty-four (24) 10 Mbps media access control (MAC) ports 50 for sending and receiving data packets in half-duplex between the respective 10 Mbps network stations 14 (ports 1-24), and two 100 Mbps MAC ports 53 for sending and receiving data packets in full-duplex between the respective 100 Mbps network stations (ports 25, 26).” (Egbert et al., Col. 5, lines 21-27). The filter checking allegedly disclosed in Egbert et al. appears to be indicative of an ingress-side processing where the switch 12 performs alleged filter checking on the data packets received off the MAC ports and not off a backplane.

In view of the above, applicants respectfully submit that none of Egbert et al., Simmons et al. and Willmann et al., individually or jointly, either teach or suggest performing “sequencing . . . ; conducting the filtering check on the data units in accordance with the sequence; conducting the watermark check on the data units; filtering the data units which fail the filtering check; delaying the data units which pass the filtering check and fail the watermark check, until the watermark check is passed; and queueing the data units which pass the filtering check and the watermark check” on the data units that have been “received via the interface having the plurality of ports off the backplane in parallel from all transmitting interfaces.”

Claims 2 depends from claim 1, and as such, claim 2 incorporates all the terms and limitations of claim 1, in addition to other limitations, which together patentably distinguish

claim 2 from the cited references. In particular, claim 2 recites, in relevant portion, “the step of sequencing the data units comprises:

- (a) determining the ports on which the data units were received; . . .
- (c) from the determinations in (a) and (b), assigning a priority to at least one data unit as a function of the number of clock cycles the data unit’s port would have to wait before initiating the release of the data unit in the event queueing clearance for the data unit were received.”

Similarly, claim 5 recites, in relevant portion, “a method for sequencing data units received on the ports for the filtering check, comprising:

- (a) determining the port on which the data units were received; . . .
- (c) from the determinations in (a) and (b), assigning a priority to at least one data unit as a function of the number of clock cycles the data unit’s port would have to wait before initiating the release of the data unit in the event queueing clearance for the data unit were received.”

In contrast, Willmann et al. do not teach or suggest “assigning a priority to at least one data unit as a function of the number of clock cycles the data unit’s port would have to wait before initiating the release of the data unit in the event queueing clearance for the data unit was received.” Rather, in Willmann et al., “[t]he queue QU1 contains two data packets D4 and D5, and the queue QU2 three data packets D6, D7, and D8. Each of these data packets is provided with a time stamp TS, which gives information on the order of arrival of the data packets.” (Col. 4, lines 14-18).

The time stamp TS in Willmann et al. “gives information on the order of arrival of the data packets,” and the priority of the data packets may be based on “the order of arrival.” However, Willmann et al. neither teach nor suggest that the priority of the data unit is based on the “number of clock cycles the data unit’s port would have to wait.” Therefore, priority of data packets in Willmann et al. appears to be based on the order of their arrival and not based on the data packet’s port (e.g., number of clock cycles the data packet’s port would have to wait).

In Advisory Action mailed May 8, 2001 for U.S. Patent Application No. 09/063,493, the Examiner has stated that “[a]pplicant’s argument is not persuasive for claim 5 because Willman discloses a step of assigning a priority to a packet as function of time “time stamp”

and using this time stamp to forward the packet." Further to applicants' earlier arguments, applicants respectfully submit that the time stamps in Willmann appear to be packet-specific without regards to the number of clock cycles the packet's port would have to wait before initiating the release of the packet. Applicants are curious to know where in Willmann is taught or suggested the limitation of "assigning a priority to at least one data unit as a function of the number of clock cycles the data unit's port would have to wait before initiating the release of the data unit." Applicants respectfully submit that this limitation is neither taught nor suggested by Willmann.

Further, none of Egbert et al., Simmons et al. and Willmann et al. either teach or suggest "assigning a priority to at least one data unit as a function of the number of clock cycles the data unit's port would have to wait before initiating the release of the data unit." In view of the above, applicants respectfully submit that claims 2 and 5 of the present application are patentably distinguishable over Egbert et al., Simmons et al. and Willmann et al. regardless of whether these cited references are considered individually or jointly.


Claims 7 and 8 depend from claim 5, and as such, claims 7 and 8 incorporate all the terms and limitations of claim 5, in addition to other limitations, which together patentably distinguish claims 7 and 8 from the cited references.

Based on the foregoing amendment and response, applicants respectfully request reconsideration and allowance of claims 1-2, 5, 7-8 and issuance of a Notice of Allowance. If the Examiner believes that a telephone conference with applicants' attorney might expedite prosecution of the application, the Examiner is invited to call at the telephone number indicated below.

Attached hereto is a marked-up version of the changes made to the specification and claims by the current amendment. The attached page is captioned "**Version with markings to show changes made.**"

Respectfully submitted,

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JEJ/mno

VERSION WITH MARKINGS TO SHOW CHANGES MADE

1. (Amended) In a data switching system having a plurality of switching controllers for exchanging data units over a backplane, at least one controller having an interface for transmitting data on the backplane and an interface having a plurality of ports for receiving data off the backplane in parallel from all transmitting interfaces, wherein at least one port is assigned a different clock cycle within a repetitive timing cycle for initiating the release of a data unit to a queue, and wherein at least one data unit must pass a filtering check and a watermark check to receive queueing clearance, a method for conducting receive processing, comprising:

sequencing the data units in said at least one controller for conducting the filtering check, the data units having been received via the interface having the plurality of ports off the backplane in parallel from all transmitting interfaces;

conducting the filtering check on the data units in accordance with the sequence;

conducting the watermark check on the data units;

filtering the data units which fail the filtering check;

delaying the data units which pass the filtering check and fail the watermark check, until the watermark check is passed; and

queueing the data units which pass the filtering check and the watermark check.